ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET- PRELIMINARY DRAFT

Permit Number: AKG572000

Small Publicly Owned Treatment Works (POTW) and other Small Treatment Works Providing Secondary Treatment of Domestic Wastewater and Discharging to Surface Water

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Public Comment Start Date: DRAFT
Public Comment Expiration Date: DRAFT

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The Alaska Department of Environmental Conservation (the Department or DEC) proposes to reissue Alaska Pollutant Discharge Elimination System (APDES) general permit to small POTWs and other small privately-owned treatment works providing secondary treatment of domestic wastewater discharging to waters of the United States (U.S.) in the State of Alaska. The general permit places conditions on the discharge of pollutants from authorized facilities to waters of the U.S. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the authorized facilities and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from small domestic wastewater facilities and the development of the permit including:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions
- technical material supporting the conditions in the permit
- proposed monitoring requirements in the permit

Public Comment

Persons wishing to comment on, or request a public hearing for the draft permit, may do so in writing by the expiration date of the public comment period.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

A request for a public hearing must state the nature of the issues to be raised, as well as the requester's name, address, and telephone number. The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 Alaska Administrative Code (AAC) 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

Appeals Process

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See http://www.dec.state.ak.us/commish/InformalReviews.htm for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See http://www.dec.state.ak.us/commish/ReviewGuidance.htm for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet and other information are located on the Department's Wastewater Discharge Authorization Program website: http://www.dec.state.ak.us/water/wwdp/index.htm.

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 610 University Avenue Fairbanks, AK 99709 (907) 451-2183
Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 410 Willoughby Avenue, Suite 310 Juneau, AK 99801 (907) 465-5180	

TABLE OF CONTENTS

TABLES

1.0 INTRODUCTION

1.1 Basis for Issuance of a General Permit

Section 301(a) of the Clean Water Act (CWA) and Title 18 Alaska Administrative Code (AAC) 83.015 provides that the discharge of pollutants is unlawful except in accordance with an Alaska Pollutant Discharge Elimination System (APDES) permit. Although such permits can be issued to individual dischargers, Alaska Department of Environmental Conservation (DEC or Department) regulations at 18 AAC 83.205 authorizes to issue an APDES general permit written to cover one or more categories or subcategories of discharges when a number of point sources:

- are located within the same geographic area and warrant similar pollution control measures;
- are involved in the same or substantially similar types of operations;
- discharge the same types of wastes;
- require the same effluent limits or operating conditions;
- require the same or similar monitoring requirements; and
- in the opinion of the Department, are more appropriately controlled under a general permit than under individual permits.

A violation of a condition contained in a general permit constitutes a violation of the CWA and subjects the owner or operator of the permitted discharge to the penalties specified in Section 309 of the CWA. Regulations at 18 AAC 83.210(a) allows a general permit to be administered according to the individual permit regulations found in 18 AAC 83.115 and 18 AAC 83.120, so the general permit may be administratively extended past the expiration date if the general permit expires prior to a new general permit being reissued provided the permittee submits a timely and complete application for a new permit prior to the expiration of the current permit.

1.2 Permit Issuance History

In 2004, the Environmental Protection Agency (EPA) identified approximately 100 small publicly owned treatment works (POTWs) and privately-owned treatment works in Alaska as candidates for general permit coverage. These were smaller facilities discharging less than 1.0 million gallons per day (mgd), treating predominately domestic wastewater to secondary treatment or equivalent to secondary treatment standards, and discharging to waters of the United States (U.S.) in the State of Alaska. The types of operations at these facilities, the wastewater discharged, operating conditions, effluent limits, and monitoring requirements were all similar in nature. Therefore, EPA determined that a general permit was the appropriate National Pollutant Discharge Elimination System (NPDES) permit mechanism for these dischargers.

Alaska Water Quality Standards (WQS), which are codified in 18 AAC 70, contain separate water quality criteria for fresh and marine water. Upon further evaluation by EPA, EPA concluded that two general permits were necessary to address the low-volume domestic discharges; one for facilities that discharged to freshwater (Permit Number AKG570000) and one for facilities that discharged to marine water (Permit Number AKG571000). Because the Alaska WQS contain water quality criteria (which serve as the basis for water quality-based permit limitations) that are different for freshwater

and marine dischargers, EPA opted for two general permits in order to clarify the requirements. Both general permits became effective July 21, 2004 and expired July 21, 2009.

In October 2008, the Department received approval from EPA to administer the NPDES Program in the State of Alaska. Rather than reissuing AKG570000 and AKG571000 as EPA had first issued them in 2004, the Department determined that it would be more effective to restructure the general permits according to specific wastewater operations. The Department identified four different operations for development into separate general permits: mechanical treatment plants, lagoons, facilities that discharge to tundra wetlands, and common collectors.

In September 2012, the Department reissued general permits AKG570000 and AKG571000 as one general permit, AKG572000, for mechanical treatment plants. AKG572000 authorized discharges from facilities that primarily use a mechanical means to treat domestic wastewater and discharge to surface water. Unlike AKG570000 and AKG571000, AKG572000 excluded wastewater treatment lagoons, common collectors, and facilities that discharge to land or dry tundra. Facilities previously authorized to discharge under either AKG570000 or AKG571000 that do not qualify for coverage under AKG572000 (i.e., lagoons, common collectors, etc.) were administratively extended under the expired general permits. Since the issuance of AKG572000, DEC has subsequently issued a general permit for wastewater treatment lagoons, AKG573000, and expects to issue a common collectors general permit, AKG575000, at some point in the future. Types of facilities and discharges not covered by AKG572000 are listed in Section 1.3 of the permit.

AKG572000 became effective November 1, 2012 and expires on October 31, 2017.

1.3 Description of Wastewater Treatment Facility Operations

The operations at wastewater treatment facilities (WWTF) that will be covered under the reissued 2017 AKG572000 General Permit generally include preliminary processes (e.g., pumping, screening, and grit removal), primary settling treatment in large primary clarifiers or sedimentation tanks to remove settleable suspended solids, and biological secondary treatment processes. The secondary treatment step is often achieved by an activated sludge system in which wastewater is continuously fed into an aerated tank where it is mixed with an active mass of microorganisms (i.e., activated sludge) capable of aerobically degrading organic matter. After a specific treatment time, the mixed liquor passes into a secondary clarifier where the sludge settles under quiescent conditions and a clarified effluent is produced for discharge. Most facilities provide some level of disinfection either via chlorination or ultra-violet radiation prior to discharge.

Identified pollutants of concern include the conventional domestic wastewater pollutants pH, five day biological oxygen demand (BOD_5), total suspended solids (TSS), dissolved oxygen (DO), and fecal coliform (FC) bacteria. Total residual chlorine (TRC) is also a pollutant of concern where chlorine is used for disinfection of wastewater to treat pathogens. The general permit includes numeric or narrative effluent limitations addressing each of these pollutants of concern. The general permit additionally contains monitoring and reporting requirements for escherichia coli (E. coli) and enterococci bacteria.

Advanced technologies used increasingly in Alaska include membrane bioreactors (MBR). MBRs combine the use of biological processes and membrane technology to provide a high standard of wastewater treatment. Instead of the secondary clarifier used in the activated sludge process, flow in

the MBR system passes through a microporous membrane while solids and large bacteria remain in the treatment system for biological degradation. MBRs can operate at longer solids detention times, thereby not only enhancing the treatment of organic matter, but producing less waste biosolids (or sludge).

The waste biosolids generated by the treatment processes is generally thickened and processed for ultimate disposal. Dewatered biosolids in Alaska are generally either co-incinerated, placed in the municipal solid waste landfill, or land applied. However, biosolids handling and disposal are regulated under separate federal regulations and therefore are not addressed by the general permit.

2.0 PERMIT COVERAGE

2.1 Facilities and Discharges Covered by the Permit

Coverage under the general permit is limited to WWTFs that treat primarily domestic wastewater to secondary treatment standards, have actual and design flow of less than 1.0 mgd, and that discharge through a discrete conveyance (i.e., outfall line, drainage ditch, channel) directly to or within 100 feet of fresh or marine surface water.

There are 93 WWTFs that were authorized to discharge under AKG572000 that are eligible for coverage under the reissued general permit. The facilities, listed in Appendix D of the permit, use processes similar to the description of operations described in Fact Sheet Section 1.3. DEC will review the notice of intents (NOIs) submitted from the 93 previously authorized WWTFs for continued authorization to discharge and will amend, as necessary, any existing authorization to reflect current operations and general permit requirements.

2.2 Applying for Coverage

The Department anticipates that there are additional facilities that should obtain coverage under the general permit. The procedure for obtaining authorization to discharge under the general permit is as follows:

2.2.1 The eligible facility submits a completed NOI to the Department at least 30 days prior to the expected start of discharge. See General Permit Section 1.4 for specific notification requirements.

2.2.2 The Department reviews the NOI for completeness.

2.2.3 If the NOI is considered complete and the facility is considered eligible for coverage under the general permit, the Department sends the permittee a written notice of authorization. Authorization to discharge under the general permit does not begin until the permittee receives a written notice of authorization, including a permit number, from the Department. If the Department determines that the NOI is incomplete, the Department will request additional information be submitted. If the Department determines that the facility is not eligible for coverage under the general permit, authorization will be denied and, if appropriate, the applicant will be directed to submit an application for an individual permit.

Pursuant to 18 AAC 83.215(a), DEC may require any permittee applying for, or covered by a general permit, to apply for and obtain an individual permit. In addition, any interested person may petition the Department to take this action. The Department may consider the issuance of an individual permit when: the discharger is not in compliance with conditions of the general permit; a change has occurred in the availability or demonstrated technology or practices; effluent limitations guidelines are promulgated for point sources covered by the general APDES permit; a water quality management plan is approved; circumstances have changed so that the discharger is no longer appropriately controlled under the general permit; the Department determines that the discharge is significant; or, a total maximum daily load has been completed for the impaired receiving water.

APDES regulations at 18 AAC 83.215(b) allow any owner or operator authorized by a general permit to request to be excluded from the coverage of the general permit by applying for an individual permit. The responsible party shall submit an individual permit application (Form 2A and Form 2M if requesting a mixing zone) with reasons supporting the request to the Department no later than 90 days after the publication of the general permit. The request shall be processed under the provisions of 18 AAC 83.115 and 18 AAC 83.120. The Department will grant the request by issuing an individual permit if the reasons cited by the responsible party are adequate to support the request.

Pursuant to 18 AAC 83.215(d), a permittee who already has authorization to discharge under an individual permit may request general permit coverage. If the Department approves coverage under a general permit, the individual permit is revoked.

2.3 Automatic Coverage

18 AAC 83.210(h) provides that the Department may notify a discharger that their discharge is covered by a general permit even if the discharger has not submitted a NOI seeking coverage. A discharger so notified may request an individual permit under 18 AAC 83.215(b).

3.0 COMPLIANCE HISTORY

Sixty-three WWTFs were authorized to discharge under AKG572000 when it became effective November 1, 2012. Throughout the permit term, an additional 35 WWTFs have received authorizations to discharge. Some of these had been administratively extended under the previous AKG570000 and others were new facilities without any prior coverage. Overall five authorizations were terminated over the course of the permit as the result of facility closures.

In order to evaluate the compliance of WWTFs currently authorized under AKG572000, DEC reviewed the data submitted by each facility as described below, to identify significant non-compliance events such as a lack of monitoring or exceedance of effluent limits that may endanger public health or the environment. It is beyond the scope and intent of this section to provide specific details on each WWTF's compliance history. For facility-specific discharge monitoring results, see EPA's Enforcement and Compliance History Online (ECHO) database at https://echo.epa.gov/.

Of the 93 currently authorized WWTFs, 20 have neither submitted any discharge monitoring reports (DMRs) for the entire authorization period nor notified DEC that there was no discharge as required by the permit. These facilities are under evaluation by DEC's Compliance and Enforcement Program. The remaining 73 WWTFs submitted DMRs with varying degrees of frequency.

In order to assess compliance with the general permit effluent limits, DEC elected, for purposes of this discussion section, to review FC bacteria and TRC maximum daily limit (MDL) violations, as these pollutants have the highest potential to endanger public health or the environment. Calendar year 2016 DMRs from each of the remaining 73 WWTFs were reviewed as these monitoring results provide the best representation of current operations at the WWTFs.

DEC's review of the 2016 DMRs revealed that nine of the 73 WWTFs either did not monitor for FC as required by their authorization, submit any DMRs in 2016, or notify DEC that there was no discharge. Eight of the remaining 64 WWTFs exceeded the TRC MDL of 1.0 milligrams per liter (mg/L) at least once in 2016. Results ranged from 1.08 mg/L to 6 mg/L. Seven of these WWTFs also exceeded their FC MDL. The FC effluent limits in the authorizations range from 40 FC/100 milliliter (mL) to 1,200 FC/100 mL with the majority of the authorizations containing effluent limits of 800 FC/100 mL. Twenty-two of the 64 WWTFs exceeded their FC MDLs at least once in 2016, and at least ten of these WWTFs exceeded more than once. Monitoring results varied from 320 FC/100 mL to greater than 2,000,000 and results that were too numerous to count.

DEC determined in the previous permit that facilities that had historically received authorizations containing high FC permit effluent limits (e.g., average monthly limit (AML) 100,000 FC/100 mL, MDL 150,000 FC/100 mL) would receive five-year compliance schedules in their authorizations to come into compliance with the more stringent FC limits (AML 200 FC/100 mL, average weekly limit (AWL) 400 FC/100 mL, MDL 800 FC/100 mL) that the majority of permittees covered by the general permit had demonstrated the capability of achieving on a regular basis. Twelve facilities received FC Compliance Schedules in their authorizations to discharge under the previous issuance of AKG572000. Two of these facilities are no longer in operation. The remaining ten facilities should continue to make progress on the compliance schedules. DEC expects that some of these facilities will achieve compliance with the final FC effluent limits described above by the five-year deadline or shortly thereafter.

4.0 EFFLUENT LIMITS

4.1 Basis for Permit Limits

The CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBEL) or water quality-based effluent limits (WQBEL). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. A discussion of the basis for the effluent limits contained in AKG572000 follows.

4.2 Technology-Based Effluent Limits

5-Day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, and Total Residual Chlorine (TRC)

In establishing permit limits, DEC first determines if there are applicable TBELs. 18 AAC 83.430 requires that, if applicable, TBELs and standards subject to the provisions of 40 Code of Federal Regulations (CFR) §122.29(d), adopted by reference in 18 AAC 83.010, must be included in an APDES permit. Section 301 of the CWA established a required technology-based performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977. "Secondary treatment" TBELs are established in 40 CFR §133.102 [adopted by reference at 18 AAC 83.010(e)]. The TBELs apply to all POTWs and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of the pollutants BOD_5, TSS, pH, and TRC.

Per 40 CFR §125.3(c)(2), the Department is also using best professional judgment under Section 402(a)(1) of the CWA to implement case-by-case technology-based secondary treatment requirements for non-POTWs (i.e., privately-owned treatment facilities) authorized to discharge domestic wastewater under this general permit. The secondary treatment requirements found in 40 CFR §133.102 were promulgated specifically for POTWs. While secondary requirements only directly apply to POTWs, the Department is applying secondary treatment standards to the privately-owned treatment facilities covered by this permit as they are identical to POTWs in mechanics and treatment efficacy, and accordingly, (the secondary standards) provide the most meaningful baseline pollutant control guidelines for this sector of privately-owned treatment facilities and discharges.

Monthly, weekly, and percent removal BOD_5 and TSS effluent requirements as well as pH minimum and maximum effluent limits may be found in the federal secondary treatment regulations at 40 CFR §133. Additionally, a MDL of 60 mg/L for BOD_5 and TSS is included in the general permit (as was required in the previous general permits) to meet the conditions of 18 AAC 83.480 (reissued permits) that require effluent limits, standards, or conditions to be at least as stringent as the final effluent limits, standards, or conditions in the previous permit.

The TRC limit of 0.5 mg/L is not found at 40 CFR §133.102 [adopted by reference at 18 AAC 83.010(e)] nor is it a state regulation; rather it is derived from standard domestic wastewater treatment operating practices. The Water Pollution Control Federation's (WPCF) Chlorination of Wastewater (1976), indicates that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual concentration is maintained after 15 minutes of contact time. The WPCF concluded that a treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L limit on a monthly average basis.

An AML of 0.5 mg/L for TRC was applied as a TBEL in the previous issuance of AKG572000 for facilities with authorized TRC mixing zones. (See Fact Sheet Section 4.0 for a discussion on mixing zones.) AKG572000 also contained a TRC MDL of 1.0 mg/L. Consistent with the conditions of 18 AAC 83.480 (reissued permits) that require effluent limits, standards, or conditions to be at least as stringent as the final effluent limits, standards, or conditions in the previous permit, and in the absence of new information to indicate TRC technological advances that would alter the WPCF's 1976 conclusions, the TRC limits that were applied as TBELs in the previous permit are being retained as TRC TBELs in this permit.

TBELs for this general permit are presented in Table 1.

Table 1: Technology-Based Effluent Limits

Parameter	Average Monthly Limit (mg/L)	Average Weekly Limit (mg/L)	Maximum Daily Limit (mg/L)	Percent Removal (%)	Basis for Limit
BOD_5	30	45	60	85	18 AAC 83.010(e)
TSS	30	45	60	85	18 AAC 83.010(e)
pH	within the range of 6.0 - 9.0 standard units (s.u.)				18 AAC 83.010(e)
TRC	0.5	---	1.0	---	18 AAC 83.480

4.3 Water Quality-Based Effluent Limits

Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in APDES permits are derived from 18 AAC 70 WQS. APDES regulations 18 AAC 83.435(a)(1) require that permits include WQBELs that "achieve water quality standard established under CWA §303, including State narrative criteria for water quality." The WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy (see Fact Sheet Section 8.0 for a discussion on antidegradation).The use classification system designates the uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the use classification of each waterbody. The antidegradation policy ensures that the existing uses and necessary water quality are maintained.

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska may also have site–specific water quality criteria per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

AKG572000 authorizes discharges of secondary treated domestic wastewater to both fresh and marine waterbodies. The designated uses for freshwater are water supply for drinking, culinary, and food processing, agriculture, aquaculture, and industrial; contact and secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. The designated uses for marine water are water supply for aquaculture, seafood processing, and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life. Numeric WQS criteria for freshwater uses and marine uses can be different and are noted below.

4.3.1 Total Residual Chlorine

The WQS for toxic and other deleterious organic and inorganic substances for freshwater uses are codified in 18 AAC 70.020(b)(11) and for marine water uses in 18 AAC 70.020(b)(23). TRC criteria provide protection for aquatic life. For freshwater the WQS requires that TRC may not exceed either an acute concentration of 0.019 mg/L or a chronic concentration of 0.011 mg/L. For marine water the WQS requires that TRC may not exceed either an acute concentration of 0.013 mg/L or a chronic concentration of 0.0075 mg/L.

4.3.2 Fecal Coliform Bacteria

WQS at 18 AAC 70.020(b)(2)(A) provides protection for freshwater designated for drinking, culinary, and food processing water supply. The WQS requires that in a 30-day period, the geometric mean may not exceed 20 FC/100 mL, and not more than 10% of the samples may exceed 40 FC/100 mL. WQS at 18 AAC 70.020(b)(14)(D) provides protection for marine water designated for harvesting for consumption of raw mollusks or other raw aquatic life. The WQS require that in a 30-day period, the geometric mean of samples may not exceed 14 FC/100 mL, and not more than 10 percent of the total samples may exceed 43 most probable number (MPN)/100 mL in a five-tube decimal dilution test.

4.3.3 Dissolved Oxygen

WQS at 18 AAC 70.020(b)(3) states that surface dissolved oxygen (DO) for freshwater uses to include the growth and propagation of fish, shellfish, other aquatic life, and wildlife must be greater than 7 mg/L and in no case may DO be greater than 17 mg/L. WQS at 18 AAC 70.020(b)(15)(C) states that surface DO for marine water uses to include the growth and propagation of fish, shellfish, other aquatic life, and wildlife must be greater than 6 mg/L and that in no case may DO be greater than 17 mg/L.

4.3.4 pH

WQS for pH at 18 AAC 70.020(b)(6) for freshwater uses and 18 AAC 70.020(b)(18)(C) for marine uses provides protection for the growth and propagation of fish, shellfish, other aquatic life, and wildlife. The WQS for both freshwater and marine water pH may not be less than 6.5 s.u. or greater than 8.5 s.u.

4.3.5 Escherichia coli (E.coli) and Enterococci Bacteria

E. coli and enterococci bacteria are indicator organisms of harmful pathogens recommended by EPA as the best indicator of health risk in water used for recreation. They are also a better indicator of acute gastrointestinal illness arising from swimming-associated activities than FC bacteria.

In 1986 EPA published Ambient Water Quality Criteria for Bacteria that contained recommended bacteria water quality criteria for primary contact recreational users. The Beaches Environmental Assessment and Coastal Health Act of 2000 requires states and territories with coastal recreation waters to adopt bacteria criteria into their WQS that are at least as protective as EPA's 1986 published bacteria criteria by April 10, 2004. Alaska did not adopt the enterococci bacteria into the WQS by the April 10, 2004 deadline, therefore EPA promulgated the 1986 bacteria criteria for Alaskan coastal recreational waters in 2004. Accordingly, monitoring for enterococci bacteria was required for all facilities authorized to discharge under the previous permit.

In 2012 EPA issued updated recreational water quality criteria (RWQC) bacteria recommendations to protect human health in all coastal and non-coastal waters designated for primary contact recreation use. Primary contact recreation includes swimming, bathing, surfing, water skiing, tubing, play by children, and similar water contact activities where a high degree of bodily contact with water, immersion, and ingestion are likely. EPA's RWQC contains two sets of water quality criteria values for enterococci and E. coli bacteria. States can choose an estimated illness rate of either 32 illnesses per 1,000 people, or 36 illnesses per 1,000 people. Either set of criteria recommendations protect primary contact recreation. The criteria are described by both a 30-day geometric mean and

statistical threshold value (STV) whereby the STV approximates the 90th percentile of the water quality distribution and is intended to be a value that should not be exceeded by more than 10 percent of the samples taken in the same 30-day period.

In January 2017, DEC adopted EPA's recommended RWCQ at the 36 illnesses per 1,000 people risk level and revised 18 AAC 70.020(b)(2)(B)(i) to adopt E. coli as the recommended freshwater WQ criteria for contact recreation and 18 AAC 70.020(b)(14)(B)(i) to adopt enterococci as the recommended contact recreation WQ criteria for marine waters. (See 4.3.5.1 and 4.3.5.2, below). EPA approved DEC's revised bacteria water quality criteria on May 15, 2017. Monitoring is required May through September when primary contact recreation in which full immersion and ingestion of water is more likely to occur.

4.3.5.1 Escherichia coli

WQS at 18 AAC 70.020(b)(2)(B)(i) provides protection for freshwater contact recreation. The WQS requires that in a 30-day period, the geometric mean shall not exceed 126 colony forming units (cfu)/100 mL. In the same 30-day period, not more than one sample, or more than 10 percent of the samples if there are more than 10 samples, may exceed a STV of 410 cfu/100 mL.

4.3.5.2 Enterococci Bacteria

WQS at 18 AAC 70.020(b)(14)(B)(i) provides protection for marine water contact recreation. The WQS requires that in a 30-day period, the geometric mean shall not exceed 35 cfu/100 mL. In the same 30-day period, not more than one sample, or more than 10 percent of the samples if there are more than 10 samples, may exceed a STV of 130 cfu/100 mL.

Table 2 lists the applicable water criteria as WQBELs for TRC, FC, Enterococci Bacteria, E. coli, DO and pH.

Table 2: Water Quality Based Effluent Limits

Parameter	Units	Water	Chronic	Acute	Basis for Limit
TRC [a]	mg/L	fresh	0.011	0.019	18 AAC 70.020(b)(11)
		marine	0.0075	0.013	18 AAC 70.020(b)(23)
FC	FC/100 mL	fresh	20 [b]	40	18 AAC 70.020(b)(2)
		marine	14 [c]	43	18 AAC 70.020(b)(14)
Enterococci Bacteria	cfu/100 mL	marine	35	130 [d]	18 AAC 70.020(b)(14)(B)(i)
E. coli	cfu/100 mL	fresh	126	410 [e]	18 AAC 70.020(b)(2)(B)(i)
DO	mg/L	fresh	may not be less than 7 or greater than 17		18 AAC 70.020(b)(3)
		marine	may not be less than 6 or greater than 17		18 AAC 70.020(b)(15)
pH	s.u.	fresh	may not be less than 6.5 or greater than 8.5		18 AAC 70.020(b)(6)
		marine	may not be less than 6.5 or greater than 8.5		18 AAC 70.020(b)(18)

Footnotes:

a. TRC effluent limits are only applicable if chlorine is used as a disinfectant.
b. Not more than one sample, or if more than ten FC bacteria samples are collected during the monthly reporting period, not more than 10% of the samples may exceed 40 FC/100 mL.
c. Not more than one sample, or if more than ten FC bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed 43 MPN/100 mL for a five-tube dilution test.
d. Not more than one sample, or if more than ten enterococci bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 130 cfu/100 mL.
e. Not more than one sample, or if more than ten E. coli bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 410 cfu/100 mL.

4.4 Flow

Flow will be based on the hydraulic design capacity of the WWTF (flow rate as gallons per day) and shall be determined by a professional engineer. The systems must comply the regulatory requirements of 18 AAC 83 and 18 AAC 72, as updated. A flow limit based on the design capacity ensures that the WWTF operates within its capabilities to receive and properly treat sustained average flow quantities and specific pollutants.

4.5 Mass-Based Limits

The general permit contains place holders for mass-based limits for BOD_5 and TSS. State regulations at 18 AAC 83.540 require that effluent limits be expressed in terms of mass unless they cannot appropriately be expressed by mass, if it is infeasible, or if the limits can be

expressed in terms of other units of measurement. In addition, 18 AAC 83.520 requires that effluent limits for a POTW be calculated based on the design flow of the WWTF. Expressing limitations in terms of concentration as well as mass encourages the proper operation of a WWTF at all times.

Because mass-based limits are derived from the facility's design flow, they must be calculated for each facility and, therefore, mass-based limits will be assigned during the authorization process. The mass-based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

$$Mass\ based\ limit\ \left(\frac{lbs}{day}\right) = concentration\ limit\ \left(\frac{mg}{L}\right) \times design\ flow\ (mgd) \times 8.34 \frac{lbs}{gal}$$

4.6 Effluent Limits Summary

The more stringent of the technology or WQBELs are included as permit limits. See Tables 3, 4, and 5, below.

5.0 MONITORING

5.1 Basis for Influent, Effluent and Receiving Waterbody Monitoring

In accordance with Alaska Statutes (AS) 46.03.101(d) and 18 AAC 83.430, the Department may specify in a permit the terms and conditions under which waste material may be disposed. Monitoring in permits is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limits are required and/or to monitor effluent impact on receiving waterbody quality. The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the Department. In addition to the pollutants that are listed in Section 4, above as having permit limits that require monitoring to track compliance, Sections 5.3 and 5.4 below, contains additional monitoring requirements for ammonia and the receiving waterbody that DEC has determined necessary to implement in the permit.

Receiving waterbody monitoring may be required in APDES permits in order to evaluate if the effluent is causing or contributing to an in stream excursion of water quality criteria. Given the nature and size of the discharges authorized under the general permit, the permit allows DEC to require receiving waterbody monitoring under specific situations. Monitoring may be required in individual authorizations for site specific evaluations related to, but not limited to: protection of WQS, evaluation of receiving waterbody impairments, threatened or endangered species, verification of mixing zone sizes, or application requirements. Permittees will be notified of any additional monitoring such as shoreline bacteria monitoring when mixing zones have the potential to touch the shoreline when issued authorization to discharge under the general permit.

5.2 Monitoring Frequencies

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance and compliance. Permittees have the option of taking more frequent samples than are required under the

general permit. These samples must be used for averaging if they are conducted using the Department-approved test methods (generally found in 18 AAC 70 and 40 CFR §136 [adopted by reference in 18 AAC 83.010]).

Facilities covered under the general permit are expected to range in size from a few hundred gallons per day (gpd) discharge up to 1 mgd. Given this wide range in discharge volume, the general permit requires monitoring frequencies that are dependent on the design flow of the facility. See Tables 3, 4, and 5, below.

The monitoring frequencies are divided into three categories:

- Class A WWTFs with a design flow above 250,000 gpd up to 1.0 mgd
- Class B WWTFs with a design flow above 5,000 gpd up to and including 250,000 gpd
- Class C WWTFs with a design flow less than and including 5,000 gpd

5.3 Total Ammonia as Nitrogen

Total ammonia is the sum of ionized (NH_4^+) and un-ionized ammonia (NH_3). Temperature and pH affect which form, NH_4^+ or NH_3 is present. NH_3, which is more toxic to aquatic organisms than NH_4^+, predominates at higher pH and temperature levels.

Biological wastewater treatment processes reduce the amount of total nitrogen in domestic wastewater; however without advanced treatment, wastewater effluent may still contain elevated levels of ammonia nitrogen. Excess ammonia nitrogen in the environment can lead to dissolved oxygen depletion, eutrophication, and toxicity to aquatic organisms.

During the last permit cycle, DEC required that the largest facilities, those that discharged above 0.25 mgd up to 1.0 mgd and that would likely have the largest impact in the environment, monitor for total ammonia as nitrogen. Four facilities discharge greater than 0.25 mgd. DEC reviewed the DMRs from these facilities and determined that the data was inconclusive and insufficient and is therefore requiring continued ammonia monitoring in the reissued permit with concurrent monitoring of the receiving waterbody for pH, temperature, and salinity (criteria for ammonia are pH, temperature, and salinity dependent). The receiving waterbody data along with the ammonia data is necessary to effectively assess the quality of each facility's discharge relative to its receiving waterbody. In order to obtain a larger data set, DEC has increased quarterly monitoring from years two through five of the permit to quarterly monitoring for the duration of the permit.

DEC will analyze the monitoring results to determine whether continued monitoring or limits for total ammonia are warranted in the next reissuance of the general permit. If DEC discontinues ammonia monitoring it will be discontinued as per the requirements for reissued permits at 18 AAC 83.480.

5.4 Receiving Waterbody Monitoring

As described in 5.3, above, ammonia criteria are pH, temperature, and salinity dependent. Therefore, those facilities that are monitoring for ammonia shall also be required to concurrently monitor the receiving waterbody for pH, temperature, and salinity (if the discharge is to marine water) at a location outside of the influence of the discharge.

Tables 3, 4, and 5 below depict effluent limitations and monitoring for facilities authorized to discharge under this general permit. The applicable table is determined by the design flow of the WWTF. The effluent limits must be met at the end of the treatment process, or for those facilities with modified limits, at the boundary of an authorized mixing zone. If a facility is authorized a mixing zone, the effluent limits in Tables 3, 4 or 5 for which a mixing zone is authorized, are superseded by the corresponding modified effluent limits in the individual authorization to discharge. Appendix D, Table B of the permit lists previously authorized facility mixing zones and corresponding modified effluent limits. DEC will notify the permittee of any modified effluent limits when issued an authorization to discharge under this general permit.

Table 3. Class A: Effluent Limits and Monitoring Requirements for Wastewater Treatment Facilities with a Design Flow above 250,000 – 1,000,000 gallons per day

Parameter	Units	Effluent Limits				Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Minimum Daily	Sample Location	Sample Frequency	Sample Type
Flow [a]	gpd	---	---	---	---	Effluent	1/day (5/week)	Measured
pH	s.u.	---	---	8.5	6.5	Effluent	1/day (5/week)	Grab
				report	---	Receiving Waterbody [b]	1/quarter	
TRC [c,d]	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	1/day (5/week)	Grab
Dissolved Oxygen	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	1/week	Grab
BOD_5	mg/L	30	45	60	---	Effluent	2/month	24-hour Composite [f]
	lbs/day [e]	---	---	---	---			Calculated
BOD_5 Percent (%) Removal [g]	%	85	---	---	---	Influent and Effluent [h]	2/month	Calculated
TSS	mg/L	30	45	60	---	Effluent	2/month	24-hour Composite [f]
	lbs/day [e]	---	---	---	---			Calculated
TSS Percent Removal [g]	%	85	---	---	---	Influent and Effluent [h]	2/month	Calculated
FC [i]	FC/100 mL	20 (fresh) [j] 14 (marine) [k]	---	40 (fresh) 43 (marine)	---	Effluent	2/month	Grab
Enterococci [i, l] (marine water)	cfu/100 mL	35	---	130 [m]	---	Effluent	1/month	Grab
E. coli [i, l] (freshwater)	cfu/100 mL	126	---	410 [n]	---	Effluent	1/month	Grab
Total Ammonia as Nitrogen [b]	mg/L	---	---	report	---	Effluent	1/quarter [o]	Grab
Temperature [b]	[o] Celsius	---	---	report	---	Receiving waterbody	1/quarter [o]	Grab
Salinity [b, p]	grams per kilogram	---	---	report	---	Receiving waterbody	1/quarter [o]	Grab

Footnotes:

a. A facility specific flow limitation shall be included as a part of the authorization to discharge.
b. Monitoring for pH, temperature, and salinity should occur at approximately the same time as ammonia monitoring.
c. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
d. Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
e. BOD_5 and TSS mass loading limits shall be included as a part of the authorization to discharge. The loading limits are calculated for each facility by the following formula: pounds per day limitation = concentration limit (mg/L) x facility design flow (mgd) x 8.34 (conversion factor). Loading limitations are applicable to the average monthly, average weekly and maximum daily basis.
f. See Appendix C for a definition.
g. Minimum % Removal = [(monthly average influent concentration in mg/L - monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100.The monthly average percent removal must be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.
h. Influent and effluent samples must be taken over approximately the same time period.
i. When more than one sample is collected in a month, the FC, enterococci and E. coli average results must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 100, 200, and 300 is (100 x 200 x 300)1/3= 181.7.
j. Not more than one sample, or if more than ten FC bacteria samples are collected during the monthly reporting period, not more than 10% of the samples may exceed 40 FC/100 mL.
k. Not more than one sample, or if more than ten FC bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed 43 most probable number/100 mL for a five-tube decimal dilution test.
l. Sampling required once per month only during the time period May-Sept. Sampling should be conducted at the same time as FC sampling.
m. Not more than one sample, or if more than ten enterococci bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 130 cfu/100 mL.
n. Not more than one sample, or if more than ten E. coli bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 410 cfu/100 mL.
o. Once per quarter means the time period of three months based on the calendar year: Jan-March, April-June, July-Sept, and Oct-Dec.
p. Salinity monitoring is only required for marine water dischargers.

Table 4. Class B: Effluent Limits and Monitoring Requirements for Wastewater Treatment Facilities with a Design Flow above 5,000 – 250,000 gallons per day

Parameter	Units	Effluent Limits				Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Minimum Daily	Sample Location	Sample Frequency	Sample Type
Flow [a]	gpd	---	---	---	---	Effluent	1/day (5/week)	Measured
pH	s.u.	---	---	8.5	6.5	Effluent	3/week	Grab
TRC [b,c]	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	3/week	Grab
Dissolved Oxygen	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	1/month	Grab
BOD_5	mg/L	30	45	60	---	Effluent	1/month	Grab or Composite [e]
	lbs/day [d]	---	---	---				Calculated
BOD_5 Percent Removal [f]	%	85	---	---	---	Influent and Effluent [g]	1/month	Calculated
TSS	mg/L	30	45	60	---	Effluent	1/month	Grab or Composite [e]
	lbs/day [d]	---	---	---				Calculated
TSS Percent Removal [f]	%	85	---	---	---	Influent and Effluent [g]	1/month	Calculated
FC [h]	FC/100 mL	20 (fresh) [j] 14 (marine) [k]	---	40 (fresh) 43 (marine)	---	Effluent	1/month	Grab
Enterococci [h, i] (marine water)	cfu/100 mL	35	---	130 [l]	---	Effluent	1/month	Grab
E. coli [h, i] (freshwater)	cfu/100 mL	126	---	410 [m]	---	Effluent	1/month	Grab

Footnotes:

a. A facility specific flow limitation shall be included as a part of the authorization to discharge.
b. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
c. Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
d. BOD_5 and TSS mass loading limits shall be included as a part of the authorization to discharge. The loading limits are calculated for each facility by the following formula: pounds per day limitation = concentration limit (mg/L) x facility design flow (mgd) x 8.34 (conversion factor). Loading limitations are applicable to the average monthly, average weekly and maximum daily basis.
e. See Appendix C for a definition.
f. Minimum % Removal = [(monthly average influent concentration in mg/L - monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100.The monthly average percent removal must be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.
g. Influent and effluent samples must be taken over approximately the same time period.
h. When more than one sample is collected in a month, the FC, enterococci and E. coli average results must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 100, 200, and 300 is (100 x 200 x 300)1/3= 181.7.
i. Sampling required once per month only during the time period May-Sept. Sampling should be conducted at the same time as FC sampling.
j. Not more than one sample, or if more than ten FC bacteria samples are collected during the monthly reporting period, not more than 10% of the samples may exceed 40 FC/100 mL.
k. Not more than one sample, or if more than ten FC bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed 43 most probable number/100 mL for a five-tube decimal dilution test.
l. Not more than one sample, or if more than ten enterococci bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 130 cfu/100 mL.
m. Not more than one sample, or if more than ten E. coli bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 410 cfu/100 mL.

Table 5. Class C: Effluent Limits and Monitoring Requirements for Wastewater Treatment Facilities with a Design Flow less than 5,000 gallons per day

Parameter	Units	Effluent Limits				Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Minimum Daily	Sample Location	Sample Frequency	Sample Type
Flow [a]	gpd	---	---	---	---	Effluent	1/week	Measured or Estimated
pH	s.u.	---	---	8.5	6.5	Effluent	1/quarter [b]	Grab
TRC [c,d]	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	1/week	Grab
Dissolved Oxygen	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	1/week	Grab
BOD_5	mg/L	30	45	60	---	Effluent	1/quarter [b]	Grab or Composite [f]
	lbs/day [e]	---	---	---				Calculated
BOD_5 Percent Removal [g]	%	85	---	---	---	Influent and Effluent [h]	1/month	Calculated
TSS	mg/L	30	45	60	---	Effluent	1/quarter [b]	Grab or Composite [f]
	lbs/day [e]	---	---	---				Calculated
TSS Percent Removal [g]	%	85	---	---	---	Influent and Effluent [h]	1/month	Calculated
FC [i]	FC/100 mL	20 (fresh) [j] 14 (marine) [k]	---	40 (fresh) 43 (marine)	---	Effluent	1/quarter [b]	Grab
Enterococci [i, l] (marine water)	cfu/100 mL	35	---	130 [m]	---	Effluent	1/quarter [b]	Grab
E. coli [i, l] (freshwater)	cfu/100 mL	126	---	410 [n]	---	Effluent	1/quarter [b]	Grab

Footnotes:

a. A facility specific flow limitation shall be included as a part of the authorization to discharge.
b. Once per quarter means the time period of three months based on the calendar year: Jan-March, April-June, July-Sept, and Oct-Dec.
c. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
d. Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
e. BOD_5 and TSS mass loading limits shall be included as a part of the authorization to discharge. The loading limits are calculated for each facility by the following formula: pounds per day limitation = concentration limit (mg/L) x facility design flow (mgd) x 8.34 (conversion factor). Loading limitations are applicable to the average monthly, average weekly and maximum daily basis.
f. See Appendix C for a definition.
g. Minimum % Removal = [(monthly average influent concentration in mg/L - monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100.The monthly average percent removal must be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.
h. Influent and effluent samples must be taken over approximately the same time period.
i. When more than one sample is collected in a month, the FC, enterococci and E. coli average results must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 100, 200, and 300 is (100 x 200 x 300)1/3= 181.7.
j. Not more than one sample, or if more than ten FC bacteria samples are collected during the monthly reporting period, not more than 10% of the samples may exceed 40 FC/100 mL.
k. Not more than one sample, or if more than ten FC bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed 43 most probable number/100 mL for a five-tube decimal dilution test.
l. Sampling required only during the time period May-Sept. Sampling should be conducted at the same time as FC sampling.
m. Not more than one sample, or if more than ten enterococci bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 130 cfu/100 mL.
n. Not more than one sample, or if more than ten E. coli bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 410 cfu/100 mL.

6.0 MIXING ZONES

Mixing zones are DEC authorized areas where an effluent undergoes initial dilution. A mixing zone is an allocated impact zone in the receiving waterbody where water quality criteria can be exceeded as long as toxic conditions are prevented and the designated use of the water as a whole are not impaired as a result of the mixing zone. All water quality criteria must be met at the boundary of the mixing zone.

In accordance with 18 AAC 70.240, as amended through June 23, 2003, DEC may authorize a mixing zone in a permit upon receipt of a complete application. A NOI serves as the mixing zone application under the general permit. The NOI provides information required by 18 AAC 70.260 (application requirements), including the information and available evidence necessary to demonstrate consistency with 18 AAC 70.240 – 270. Permittees may request modification to effluent limits pursuant to 18 AAC 70.260. If a mixing zone is requested, Form 2M must also be submitted with the NOI. Form 2M may be located through the link in part 1.4.2 of the general permit. Per 18 AAC 70.260, the burden of proof for justifying a mixing zone rests with the applicant. Note the Department has determined that existing dischargers listed in Appendix D of the permit (that requested a mixing zone) have satisfied this requirement. The Department will consider mixing zone requests on a case-by-case basis, and the Department will, in its discretion, only authorize a mixing zone if it finds that available evidence reasonably demonstrates that the requirements of 18 AAC 70 will be met. New or modified mixing zones that the Department has not previously public noticed will be public noticed in accordance with 18 AAC 83.120.

Appendix A outlines criteria that must be met prior to the Department authorizing a mixing zone. These criteria include an analysis of the size of the mixing zone, treatment technology, existing uses of the waterbody, human consumption, spawning areas, human health, aquatic life, and endangered species. All criteria must be met in order to authorize a mixing zone. If criteria are not met, then a mixing zone is prohibited and effluent limits must be met at the end of the outfall line prior to discharge to the receiving waterbody.

The Department may establish limits at the boundary of an authorized mixing zone in the receiving waterbody. These limits shall be based on the limits and requirements of 18 AAC 70. The permittee will be notified of any receiving waterbody limits when issued authorization by DEC to discharge under the general permit.

The Department reviewed effluent and mixing zone monitoring data for each of the facilities that were previously authorized mixing zones underAKG572000. The monitoring results do not support revising the mixing zones, nor is there a documented basis for concern to do so at this time. Therefore, the mixing zones for each of the facilities previously authorized under AKG572000 shall be reauthorized. If facility conditions change (e.g. increase flow volume) requiring the permittee to provide updated mixing information, DEC will evaluate the submitted information to determine if modification of the existing mixing zone authorization is warranted.

7.0 COMPLIANCE SCHEDULES

Per 18 AAC 70.910, the Department has authority to include compliance schedules as conditions of a permit, certification, or approval.

8.0 ANTIBACKSLIDING

18 AAC 83.480(a) requires that "interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the permit was issued, and the change in circumstances would cause for permit modification or revocation and reissuance under 18 AAC 83.135." 18 AAC 83.480(c) also states that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued." The effluent limitations in this permit reissuance are consistent with 18 AAC 83.480. Therefore, the permit effluent limitations, standards, and conditions in AKG572000 are as stringent as in the previously issued permit. Accordingly, no further backsliding analysis is required for this permit reissuance.

9.0 ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for waterbodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's Antidegradation Policy. The Antidegradation Policy of the Alaska WQS (18 AAC 70.015) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. This section analyzes and provides rationale for the Department's decisions in the permit reissuance with respect to the Antidegradation Policy.

The Department's approach to implementing the Antidegradation Policy found in 18 AAC 70.015 is based on the requirements in 18 AAC 70 and the Department's *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods* dated July 14, 2010. Using these procedures and policies, the Department determines whether a waterbody or a portion of a waterbody is classified as Tier 1, Tier 2, or Tier 3, where a higher numbered tier indicates a greater level of water quality protection. At this time, no Tier 3 waters have been designated in Alaska. Where there is insufficient information to make a determination about water quality, the Department presumes that the water is of high quality and subject to at least Tier 2 protection. There is insufficient information to make a reasonable determination of water quality for all potential waterbodies under AKG572000 on a parameter-by-parameter basis. Accordingly, this antidegradation analysis conservatively assumes that all parameters and discharges under the APDES general permit will be to Tier 2 receiving waters, which is the next highest level of protection and is more rigorous than a Tier 1 analysis.

The State's Antidegradation Policy in 18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (i.e. Tier 2 waters), that quality must be maintained and protected. The Department may allow a reduction of water quality only after finding that five specific requirement of the Antidegradation Policy at 18 AAC 70.015(a)(2)(A)-(E) are met. 18 AAC 70.015(a)(2)(A)-(E) and the Department's findings are as follows:

- ***18 AAC 70.015 (a)(2)(A). Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.***

  Based on the evaluation required under 18 AAC 70.015(a)(2)(D) below, the Department has determined that the most reasonable and effective polluting prevention, control, and treatment methods are being used and that the localized lowering of water quality is necessary.

  Because of the nature of the discharges, all existing facilities covered under the general permit, expansions of existing facilities (still resulting in a total design flow of less than 1.0 mgd), and facilities authorized to discharge under the general permit for the first time would be expected to cause only minor degradation of water quality. All facilities authorized to discharge under the general permit are minor POTWs or other facilities treating domestic wastewater with design discharge flows of less than 1.0 mgd. Furthermore, most facilities authorized to discharge have flow volumes that are considerably less than 1.0 mgd. These facilities do not receive significant contributions from non-domestic industrial users. Facilities not meeting these criteria are excluded from coverage under the general permit. The effluent limits in the general permit are consistent with all applicable technology standards and Alaska WQS and, as discussed above in Section 8.0, are as stringent as the effluent limits in the previously issued general permit. Consequently, the allowable concentrations of pollutants discharged by facilities covered under the existing general permit remain the same.

  The treatment processes used at the treatment facilities covered under the general permit are considered standard secondary treatment (e.g., activated sludge) and are processes commonly used by POTWs and other privately-owned treatment works treating domestic wastewater throughout the U.S. A major upgrade of treatment processes or implementation of other wastewater disposal alternatives designed to eliminate the potential for minor degradation of water quality, if technically feasible, would require a substantial financial investment for both community-based POTWs and small privately owned treatment works as well as state and federal grant and loaning agencies, and could result in an increase in user and consumer fees. Increased treatment costs and consumer fees lead to decreases in "after tax" or disposable personal income (DPI) spending of ratepayers. Reductions in DPI in a community's local economy would result in fewer dollars being spent on non-essential goods and services by ratepayers, ultimately leading to decreases in labor demand, which further impacts household spending due to losses in employment.

  WWTFs, facility expansions, and surface water discharges from new facilities accommodate planned and approved growth in the areas surrounding the facilities. Thus, current and future development in the communities served by the facilities authorized to discharge under the general permit is dependent on collection, treatment, and discharge of wastewater. Eliminating or requiring implementation of alternatives to existing discharges, prohibiting capacity increases of existing discharges, and prohibiting coverage of new dischargers under the general permit would inhibit important socioeconomic growth and development in the areas where the discharges are located.

  DEC determined that the permitted activities are necessary to accommodate important economic and social development and the anticipated lowering of water quality is necessary for these purposes; therefore, the 18 AAC 70.015(a)(2)(A) finding is met.

- ***18 AAC 70.015 (a)(2)(B). Except as allowed under this subsection, reducing water quality will not violate the applicable criteria of 18 AAC 70.020 or 18 AAC 70.235 or the whole effluent toxicity limit in 18 AAC 70.030.***

  Facilities with wasteload allocations from an approved total maximum daily load analysis and facilities discharging a pollutant that causes or contributes to an impairment of a waterbody listed as impaired on the CWA Section 303(d) list are excluded from coverage under the general permit. Therefore, discharges authorized by the general permit will not cause or contribute to impairment of the state's waters. Furthermore, general permit conditions stipulate that the discharge shall not cause contamination of surface or ground waters nor shall the discharge cause a violation of Alaska WQS 18 AAC 70.

  Identified pollutants of concern in treated domestic wastewater include the conventional pollutants BOD_5, TSS, oil and grease, pH, and FC. TRC is also a pollutant of concern where chlorine is used for treatment of pathogens. Enterococci and E. coli bacteria are indicator organisms of harmful pathogens. The general permit includes numeric or narrative effluent limits and best management practices addressing each of these pollutants of concern.

  Except where a mixing zone has been authorized by the Department, pH, dissolved oxygen, and total residual chlorine WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes. In addition, if a mixing zone is authorized, all water quality criteria must be met at the boundary of the mixing zone to ensure all criteria are met in the water body and the water body as a whole is protected. The water quality criteria in 18 AAC 70.020 is a legal basis for the permit effluent limits, of which serve the specific purpose of protecting the existing and designated uses.

  The Department will not authorize a discharge under the general permit to waters that have established or adopted site-specific criteria in the vicinity of the discharge. Therefore, criteria allowed by 18 AAC 70.235 will not be violated.

  In addition, any facility receiving a significant contribution from a non-domestic industrial user is excluded from coverage under the general permit. Because of the nature of the permitted discharges, other pollutants are not expected to be present in the discharges at levels that would cause, have the reasonable potential to cause, or contribute to an exceedance of any Alaska WQS, including the whole effluent toxicity limit at 18 AAC 70.030.

  DEC determined that the reduction in water quality will not violate the criteria of 18 AAC 70.020, 18 AAC 70.235, or 18 AAC 70.030; therefore, 18 AAC 70.015(a)(2)(B) finding is met.

- ***18 AAC 70.015(a)(2)(C). The resulting water quality will be adequate to fully protect existing uses of the water.***

  The general permit requires eligible POTWs and other privately-owned treatment facilities treating domestic wastewater to meet numeric and narrative effluent limits. The effluent limits and best management practices are derived from and comply with the applicable technology standards and Alaska WQS, including the most stringent water quality criteria for each pollutant of concern to ensure protection of all water use classes in Alaska's WQS.

The general permit requires influent and effluent monitoring at frequencies based on design flow. Facilities with larger design flows are required to monitor more frequently than facilities with smaller design flows. The results of this monitoring must be reported to DEC. In addition, DEC will perform permit compliance inspections to meet the goals of the Department's Division of Water Compliance Program. The permit allows DEC to require additional or receiving waterbody monitoring through the authorization to discharge for site-specific evaluations related to protection of WQS, evaluation of receiving water impairments, or evaluation of issues associated with threatened or endangered species.

DEC determined that the discharges from POTWs and other privately-owned treatment facilities treating domestic wastewater operating under the terms and conditions of the general permit will be adequate to fully protect the existing uses of the water; therefore, 18 AAC 70.015(a)(2)(C) finding is met.

- ***18 AAC 70.015(a)(2)(D). The methods of pollution prevention, control, and treatment found by the department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.***

  The general permit contains effluent limits for BOD_5 and TSS based on the federal secondary treatment standards at 40 CFR §133.102 and 40 CFR §133.105 adopted by reference at 18 AAC 83.010(e). These standards are appropriately applied to all facilities discharging domestic wastewater (including privately-owned treatment facilities) under 18 AAC 72.050. The activated sludge treatment processes used at the treatment facilities covered under the general permit are considered standard secondary treatment processes used by POTWs and other privately-owned treatment facilities treating domestic wastewater throughout the U.S.

  The pH, enterococci, E.coli, FC, TRC, and DO limits in the permit are derived from and comply with Alaska's WQS. These limits are applied based on attaining the most stringent applicable water quality criteria at the point of discharge or on attaining these water quality criteria at the boundary of a mixing zone authorized pursuant to 18 AAC 70.240. Any modified effluent limits based on an authorized mixing zone must also comply with the applicable technology standards. For example, modified pH limits may not be less than 6.0 or greater than 9.0 standard units, which are the secondary treatment standards for pH. These values were included in the previous general permit based on standard treatment practices and have been carried over to the reissued general permit.

  DEC determined that the methods of prevention, control, and treatment to be most effective are the practices and requirements set out in the permit; therefore, 18 AAC 70.015(a)(2)(D) finding is met.

- ***18 AAC 70.015(a)(2)(E). All wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable best management practices.***

  The "highest statutory and regulatory requirements" are defined in 18 AAC 70.990(30) (as amended June 26, 2003) as:

- (A) any federal TBEL identified in 40 CFR §125.3 and 40 CFR §122.29, as amended through August 15, 1997, adopted by reference;
- (B) minimum treatment standards in 18 AAC 72.040; and
- (C) any treatment requirement imposed under another state law that is more stringent than a requirement of this chapter.

The first part of the definition includes all federal TBELs including "For POTWs, effluent limitations based upon….Secondary Treatment" at 40 CFR §125.3(a)(1) defined at 40 CFR §133.102. CWA Section 304(d) required EPA to publish information on the degree of effluent reduction attainable through the application of secondary treatment for certain types of POTWs. Section 301(b)(1)(b) requires POTWs to meet effluent limits based on secondary treatment standards. EPA promulgated secondary treatment standards at 40 CFR §133. Alaska adopted these standards by reference at 18 AAC 83.010(e). Facilities receiving authorization to discharge under AKG572000 must meet the terms and conditions included in the permit that are derived from and comply with these statutory and regulatory requirements.

TBELs found at 40 CFR §133 include BOD_5, TSS, and pH. These limits are applied as TBELs in the permit. The regulations at 40 CFR §122.29 refers to industrial wastewater discharge and do not apply to the permit's domestic wastewater discharge.

The second part of the definition 18 AAC 70.990(B)(2003) appears to be in error, as 18 AAC 72.040 describes discharges to sewers and not minimum treatment. The correct reference appears to be the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges. Coverage under the general permit will be limited to facilities that provide secondary treatment of domestic wastewater in accordance with the minimum standards at 18 AAC 72.050. The permit also includes stipulations that meet or exceed the intent of 18 AAC 70.990.

The third part of the definition refers to treatment requirements imposed under another State law that are more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that apply to this permitting action include 18 AAC 15 and 18 AAC 72. Neither the regulations in 18 AAC 15 and 18 AAC 72, nor another State law that the Department is aware of impose more stringent requirements than those found in 18 AAC 70.

After review of the methods of treatment and control and the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge authorized under this general permit meets the highest applicable statutory and regulatory requirements; therefore, 18 AAC 70.015(a)(2)(E) finding is met.

10.0 SPECIAL CONDITIONS

10.1 Quality Assurance Project Plan

The permittee is required to develop, implement, and maintain a quality assurance project plan (QAPP). The QAPP must be designed to assist in planning for the collection and analysis of effluent and receiving water samples in support of the permit. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; laboratory analysis; precision and accuracy requirements; data reporting; and quality assurance

/quality control criteria. The QAPP will help ensure the accuracy of monitoring data and potentially explain anomalies if they occur. The QAPP must be developed and implemented within 180 days of receiving authorization under this general permit. Any existing QAPP for the facility may be modified to meet the requirements of Section 2.6 of the permit. The QAPP is required to be retained onsite and made available to DEC upon request.

10.2 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

10.3 Electronic Reporting (E-Reporting) Rule

The permittee is responsible for electronically submitting DMRs and other reports in accordance with 40 CFR §127. The start dates for e-reporting are provided in 40 CFR §127.16. DEC has established a website at http://dec.alaska.gov/water/Compliance/EReportingRule.htm that contains general information. As DEC implements the E-Reporting Rule, more information will be posted on this webpage. The permittee will be further notified by DEC in the future about how to implement the conditions in 40 CFR §127.

11.0 OTHER CONSIDERATIONS

11.1 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species or their habitats. NMFS is responsible for administration of the ESA for listed cetaceans, seals, sea lions, sea turtles, anadromous fish, marine fish, marine plants, and corals. All other species (including polar bears, walrus, and sea otters) are administered by the USFWS. As a state agency, DEC is not required to consult with USFWS or NMFS regarding permitting actions; however, DEC interacts voluntarily with these federal agencies to obtain listings of threatened and endangered species and critical habitat.

DEC interacts voluntarily with the Services to provide them an early opportunity to provide listings of threatened and endangered species and notify DEC of any potential impacts on listed species or critical habitat under their respective jurisdictions. On November 29, 2016, DEC contacted USFWS and NMFS to provide them early notification of DEC's intent to reissue AKG572000 and to provide them the above mentioned opportunity to share concerns with DEC regarding listed species. USFWS did not respond to DEC's notification.

For a listing of threatened and endangered species, DEC consulted the NMFS site at http://www.fakr.noaa.gov/protectedresources/default.htm and the USFWS *Endangered, Threatened, Proposed, Candidate, and Delisted Species in Alaska* table, and may be accessed through the following link: https://www.fws.gov/alaska/fisheries/endangered/index.htm

The Department reviews the listing periodically for updates. Species of concern that inhabit or that have inhabited Alaskan waters at least at one time and that are listed as threatened, endangered or as a candidate for listing are included in Table 6.

Table 6: Threatened and Endangered Species

Species Name	Scientific Name	Listing Status
Abalone, pinto	*Haliotis kamtschatkana*	Candidate for listing
Albatross, short-tailed	*Phoebastria albatrus*	Endangered
Bear, polar	*Ursus maritimus*	Threatened
Eider, spectacled	*Somateria fischeri*	Threatened
Eider, Stellar's	*Polysticta stelleri*	Threatened
Herring, Pacific Southeast Alaska distinct population segment	*Clupea pallasi*	Candidate for listing
Loon, yellow-billed	*Gavia adamsii*	Candidate for listing
Otter, northern sea Southwest Alaska distinct population segment	*Enhydra lutris kenyoni*	Threatened
Seal, bearded Beringia distinct population segment	*Erignathus barbatus nauticus*	Threatened
Seal, Iliamna Harbor	*Phoca vitulina richardii*	Candidate for listing
Seal, ringed, Arctic subspecies	*Phoca hispida hispida*	Threatened
Sea turtle, green*	*Chelonia mydas,* including *agassizi*	Threatened
Sea turtle, leatherback*	*Dermochelys coriacea*	Endangered
Sea turtle, loggerhead*	*Caretta caretta*	Threatened
Sea turtle, Olive Ridley*	*Lepidochelys olivacea*	Threatened
Sea-lion, Stellar western population (west of 144º longitude)	*Eumetopias jubatus*	Endangered
Walrus, Pacific	*Odobenus rosmarus divergens*	Candidate for listing
Whale, blue*	*Balaenoptera musculus*	Endangered
Whale, bowhead	*Balaena mysticetus*	Endangered
Whale, Cook Inlet beluga	*Delphinapterus leucas*	Endangered
Whale, fin	*Balaenoptera physalus*	Endangered
Whale, humpback	*Megaptera novaeangliae*	Endangered
Whale, gray* western North Pacific distinct population segment	*Eschrichtius robustus*	Endangered
Whale, North Pacific right*	*Eubalaena japonica*	Endangered
Whale, sei*	*Balaenoptera borealis*	Endangered
Whale, sperm	*Physeter macrocephalus*	Endangered
*Occurs rarely in Alaska		

11.2 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) designates Essential Fish Habitat (EFH) in waters used by anadromous salmon and various life stages of marine fish under NMFS jurisdiction. EFH refers to those waters and associated river bottom substrates necessary for fish spawning, breeding, feeding, or growth to maturity—including aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish. Spawning, breeding, feeding, or growth to maturity covers a species' full life cycle necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity.

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Section 305(b) of the Magnuson-Stevens Act 916 USC 1855(b) requires federal agencies to consult the NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated EFH as defined by the Act. As a state agency, DEC is not required to consult with NMFS regarding permitting actions, but interacts voluntarily with NMFS to identify EFH.

On November 29, 2016, DEC contacted NMFS to provide them early notification of DEC's intent to reissue AKG572000 and to provide them the opportunity to share concerns with DEC regarding EFH. NMFS responded to DEC on November 29, 2016 with links to their websites containing Alaska specific ESA information and EFH.

11.3 Ocean Discharge Criteria Evaluation

Section 403(a) of the CWA, Ocean Discharge Criteria, prohibits the issuance of a permit under Section 402 of the CWA for a discharge into the territorial sea, the water of the contiguous zone, or the oceans except in compliance with Section 403. Permits for discharges seaward of the baseline on the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge Criteria Evaluation (ODCE).

Interactive nautical charts depicting Alaska's baseline plus additional boundary lines are available at http://www.charts.noaa.gov/OnLineViewer/AlaskaViewerTable.shtml and interactive maps at https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA_Baseline/MapServer.

The charts and maps are provided for informational purposes only. The U.S. Baseline committee makes the official determinations on baseline. Ocean Discharge Criteria are not applicable for marine discharges to areas located landward of the baseline of the territorial sea.

The general permit requires compliance with State WQS. Consistent with 40 CFR §125.122(b), adopted by reference at 18 AAC 83.010(C)(8), discharges in compliance with State WQS shall be presumed not to cause unreasonable degradation of the marine environment. EPA made the connection between the similar protections provided by ODCE requirements and WQS when promulgating ocean discharge criteria rules in 1980, as stated, "the similarity between the objectives

and requirements of [state WQS] and those of CWA Section 403 warrants a presumption that discharges in compliance with these [standards] also satisfy CWA Section 403." (Ocean Discharge Criteria, 45 Federal Register 65943.) As such, given the permit requires compliance with State WQS, unreasonable degradation to the marine environment is not expected and further analysis under 40 CFR §125.122 is not warranted for this permitting action.

11.4 Permit Expiration

The permit will expire five years from the effective date of the permit.

REFERENCES

ADEC (Alaska Department of Environmental Conservation). 2003. 18 AAC 70 Water Quality Standards, as amended through June 26, 2003.

ADEC. 2008. Alaska water quality criteria manual for toxics and other deleterious organic and inorganic substances, as amended through December 12, 2008.

ADEC. 2010. Interim antidegradation methods, Effective July 14, 2010.

ADEC. 2010. Alaska's final 2010 integrated water quality monitoring and assessment report, July 15, 2010.

ADEC. 2016. 18 AAC 70 Water Quality Standards, as amended through February 19, 2016.

EPA (Environmental Protection Agency). 1986. Ambient water quality criteria for baceteria-1986. US Environmental Protection Agency, Office of Water, EPA 440/5-84-002, Washington D.C.

EPA. 1991. Technical support document for water quality-based toxics control. EPA/505/2-90-001.

National Marine Fisheries Service. 2016. E-mail from Jon Kurland, NMFS, dated November 29, 2016 regarding threatened and endangered species and essential fish habitat.

Tetra Tech, Inc. 2010a. *Unpublished*. Alaska general permits for small wastewater treatment plants, fact sheet discussion—antidegradation policy implementation. Located at: Alaska Department of Environmental Conservation, 610 University Avenue, Fairbanks, Alaska and Alaska Department of Environmental Conservation 555 Cordova Street, Anchorage, Alaska.

Water Pollution Control Federation. 1976. Chlorination of wastewater, manual of practice no. 4. Moore & Moore, Washington D.C

APPENDIX A: MIXING ZONE ANALYSIS CHECK LIST

The purpose of the Mixing Zone Check List is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 through 18 AAC 70.270 are satisfied, as well as provide justification to establish a mixing zone in an APDES permit. In order to establish a mixing zone, all criteria must be met. The permit writer must document all conclusions in the permit Fact Sheet; however, if the permit writer determines that one criterion cannot be met, then a mixing zone is prohibited, and the permit writer need not include in the Fact Sheet the conclusions for when other criteria were met.

Criteria	Description	Resources	Regulation
Size	Is the mixing zone as small as practicable?	• EPA Permit Writers' Manual	18 AAC 70.240 (a)(2) 18 AAC 70.245 (b)(1) - (b)(7) 18 AAC 70.255(e) (3) 18 AAC 70.255 (d)
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants?		18 AAC 70.240 (a)(3)
Low Flow Design	**For river, streams, and other flowing freshwaters.** - Determine low flow calculations or documentation for the applicable parameters.		18 AAC 70.255(f)
Existing use	Does the mixing zone…		
	(1) partially or completely eliminate an existing use of the waterbody outside the mixing zone? If yes, mixing zone prohibited.		18 AAC 70.245(a)(1)
	(2) impair overall biological integrity of the waterbody? If yes, mixing zone prohibited.		18 AAC 70.245(a)(2)
	(3) provide for adequate flushing of the waterbody to ensure full protection of uses of the waterbody outside the proposed mixing zone?		18 AAC 70.250(a)(3)

Criteria	Description	Resources	Regulation
	If no, mixing zone prohibited.		
	(4) cause an environmental effect or damage to the ecosystem that the department considers to be so adverse that a mixing zone is not appropriate? If yes, then mixing zone prohibited.		18 AAC 70.250(a)(4)
Human consumption	Does the mixing zone…		
	(1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? If yes, mixing zone may be reduced in size or prohibited.		18 AAC 70.250(b)(2)
	(2) preclude or limit established processing activities of commercial, sport, personal use, or subsistence shellfish harvesting? If yes, mixing zone may be reduced in size or prohibited.		18 AAC 70.250(b)(3)
Spawning Areas	Does the mixing zone…		
	(1) discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, king, and sockeye salmon? If yes, mixing zone prohibited.		18 AAC 70.255 (h)
Human Health	Does the mixing zone…		
	(1) contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? If yes, mixing zone prohibited.		18 AAC 70.250 (a)(1)
	(2) contain chemicals expected to cause carcinogenic, mutagenic, tetragenic, or otherwise harmful effects to human health? If yes, mixing zone prohibited.		

Criteria	Description	Resources	Regulation
	(3) create a public health hazard through encroachment on water supply or through contact recreation? If yes, mixing zone prohibited.		18 AAC 70.250(a)(1)(C)
	(4) meet human health and aquatic life quality criteria at the boundary of the mixing zone? If no, mixing zone prohibited.		18 AAC 70.255 (b),(c)
	(5) occur in a location where the department determines that a public health hazard reasonably could be expected? If yes, mixing zone prohibited.		18 AAC 70.255(e)(3)(B)
Aquatic Life	Does the mixing zone…		
	(1) create a significant adverse effect to anadromous, resident, or shellfish spawning or rearing? If yes, mixing zone prohibited.		18 AAC 70.250(a)(2)(A-C)
	(2) form a barrier to migratory species? If yes, mixing zone prohibited.		
	(3) fail to provide a zone of passage? If yes, mixing zone prohibited.		
	(4) result in undesirable or nuisance aquatic life? If yes, mixing zone prohibited.		18 AAC 70.250(b)(1)
	(5) result in permanent or irreparable displacement of indigenous organisms? If yes, mixing zone prohibited.		18 AAC 70.255(g)(1)
	(6) result in a reduction in fish or shellfish population levels? If yes, mixing zone prohibited.		18 AAC 70.255(g)(2)

Criteria	Description	Resources	Regulation
	(7) prevent lethality to passing organisms by reducing the size of the acute zone? If yes, mixing zone prohibited.		18 AAC 70.255(b)(1)
	(8) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? If yes, mixing zone prohibited.		18 AAC 70.255(b)(2)
Endangered Species	Are there threatened or endangered species (T/E spp) at the location of the mixing zone? If yes, are there likely to be adverse effects to T/E spp based on comments received from USFWS or NOAA? If yes, will conservation measures be included in the permit to avoid adverse effects? If yes, explain conservation measures in Fact Sheet. If no, mixing zone prohibited.		Program Description, 6.4.1 #5 18 AAC 70.250(a)(2)(D)